

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A system for use in programming and diagnostics of electronic devices in a vehicle that communicate via a data communication bus in the vehicle, the system comprising:

(a) a connector jack having a plurality of electrical connection sites configured for electrical connection to the electronic devices in the vehicle;

(b) a shorting plug configured to removably engage the connector jack, the shorting plug electrically interconnecting the plurality of electrical connection sites to form the data communication bus when the shorting plug is engaged with the connector jack; and

(c) an electronics module configured to removably engage the connector jack in place of the shorting plug, the electronics module including a plurality of switching units that electrically connect to the plurality of electrical connection sites in the connector jack when the electronics module is engaged with the connector jack, wherein the switching units, when set in a closed state, electrically interconnect the electrical connection sites in the connector jack to form the data communication bus, each switching unit being operable independently from the other switching units so that one or more of the switching units may be set in an open state to electrically disconnect an electronic device from the data communication bus.

2. The system of Claim 1, wherein the connector jack further includes an electrical connection site for connection to a power source.

3. The system of Claim 1, wherein the connector jack further includes an electrical connection site for connection to a bus interface connector.

4. The system of Claim 1, further comprising a cover plug configured to removably engage the connector jack to cover one or more of the electrical connection sites.

5. The system of Claim 1, wherein one or more of the switching units comprise a plurality of switches that are collectively set in an open or closed state in the switching unit.

6. The system of Claim 1, wherein the electronics module further includes a processing unit in communication with the switching units for controlling the opening and closing of the switching units in accordance with instructions carried out by the processing unit.

7. The system of Claim 6, wherein the processing unit is in communication with the data communication bus, and wherein the instructions carried out by the processing unit are received via the data communication bus from an external programming device connected to the data communication bus.

8. The system of Claim 6, wherein the electronics module further includes a memory in communication with the processing unit, the memory having instructions stored therein, and wherein the instructions carried out by the processing unit are received from the memory.

9. The system of Claim 6, wherein the electronics module further includes a user input in communication with the processing unit, and wherein the instructions carried out by the processing unit are received from the user input.

10. The system of Claim 1, wherein the electronics module further includes a processing unit in communication with the data communication bus for monitoring data communicated on the data communication bus and selectively setting one or more of the switching units in an open or closed state based on the data communicated on the data communication bus.

11. The system of Claim 10, wherein the processing unit is configured to set one or more of the switching units in an open state to electrically disconnect one or more electronic devices from the data communication bus if an abnormality in the data communicated on the data communication bus is detected by the processing unit.

12. The system of Claim 11, wherein the processing unit electrically disconnects electronic devices in a sequence until the processing unit no longer detects the abnormality on the data communication bus.

13. The system of Claim 11, wherein the processing unit is configured to electrically disconnect electronic devices in a determined order of criticality to the

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operation of the vehicle, from an electronic device designated least critical to an electronic device designated most critical.

14. The system of Claim 10, wherein the electronics module further includes a memory in communication with the processing unit for recording information related to an abnormality detected by the processing unit in the data communicated on the data communication bus.

15. The system of Claim 14, wherein the processing unit is configured to record information related to a detected abnormality for a period of time.

16. The system of Claim 10, wherein the electronics module further includes an output device in communication with the processing unit, and wherein the processing unit is configured to report via the output device information related to an abnormality detected by the processing unit in the data communicated on the data communication bus.

17. A method for use in programming electronic devices in a vehicle that communicate via a data communication bus in the vehicle, comprising:

(a) connecting the electronic devices in the vehicle to the data communication bus via switching units;

(b) connecting a programming device to the data communication bus for transmitting programming codes via the data communication bus to an electronic device in the vehicle that is to be programmed, the switching unit connecting the electronic device to be programmed being set in a closed state;

(c) electrically disconnecting from the data communication bus other electronic devices in the vehicle that are not to be programmed, by setting the switching units that connect the other electronic devices to the data communication bus in an open state; and

(d) transmitting the programming codes from the programming device to the electronic device to be programmed via the data communication bus.

18. The method of Claim 17, further comprising connecting the other electronic devices to the data communication bus by setting the switching units that connect the other electronic devices in a closed state, after transmission of the programming codes is completed.

19. The method of Claim 17, wherein connecting a programming device to the data communication bus comprises connecting the programming device to a bus interface connector that is electrically connected to the data communication bus.

20. The method of Claim 17, further comprising:

(a) providing a connector jack having a plurality of electrical connection sites, wherein each electrical connection site is electrically connected to at least one of the electronic devices in the vehicle;

(b) providing an electronics module that removably engages the connector jack, the electronics module including the switching units that connect the electronic devices to the data communication bus; and

(c) instructing the electronics module to electrically disconnect from the data communication bus the other electronic devices that are not to be programmed by setting in an open state the switching units that connect the other electronic units to the data communication bus.

21. The method of Claim 20, further comprising providing a shorting plug configured to removably engage the connector jack in place of the electronics module, the shorting plug interconnecting the plurality of electrical connection sites to form the data communication bus when the shorting plug is engaged with the connector jack.

22. The method of Claim 21, further comprising reconnecting to the data communication bus the other electronic devices that were electrically disconnected from the data communication bus by disengaging the electronics module from the connector jack and engaging the shorting plug with the connector jack.

23. A method for use in diagnostics of electronic devices in a vehicle that communicate via a data communication bus in the vehicle, the method comprising:

(a) connecting the electronic devices in the vehicle to the data communication bus via switching units;

(b) monitoring data communicated by the electronic devices on the data communication bus for abnormalities; and

(c) if an abnormality is detected, setting at least one of the switching units in an open state to electrically disconnect from the data

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communication bus at least one of the electronic devices to help identify the electronic device that is causing the abnormality.

24. The method of Claim 23, wherein the electronic devices are electrically disconnected from the data communication bus in a sequence until the abnormality is no longer detected on the data communication bus.

25. The method of Claim 24, wherein the electronic devices are electrically disconnected in a determined order of criticality to the operation of the vehicle, from an electronic device designated least critical to an electronic device designated most critical.

26. The method of Claim 23, further comprising:

- (a) providing an electronics module that includes the switching units that connect the electronic devices to the data communication bus; and
- (b) providing a processing unit in communication with the data communication bus,

wherein the processing unit monitors the data communicated by the electronic devices on the data communication bus, and if an abnormality in the data is detected by the processing unit, the processing unit instructs the electronics module to set at least one of the switching units in an open state to electrically disconnect at least one of the electronic devices from the data communication bus.

27. The method of Claim 26, further comprising providing a memory in communication with the processing unit and storing in the memory information relating to an abnormality detected by the processing unit.

28. The method of Claim 26, further comprising:

- (a) providing an output device in communication with the processing unit;
- (b) producing a report that includes information relating to the detected abnormality; and
- (c) transmitting the report to the output device.

29. An electronics module for use in programming and diagnostics of electronic devices in a vehicle that are configured to communicate via a data communication bus, the electronics module comprising:

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(a) a plurality of switching units configured to connect to the electronic devices in the vehicle, wherein when the switching units are set in a closed state, the electronic devices in the vehicle are interconnected in the electronics module to form the data communication bus, and when set in an open state, the switching units electrically disconnect the electronic devices from the data communication bus; and

(b) a processing unit in communication with the plurality of switching units for selectively setting each of the switching units in an open or closed state.

30. The electronics module of Claim 29, wherein the processing unit is configured to set each of the switching units in an open or closed state in accordance with instructions carried out by the processing unit.

31. The electronics module of Claim 30, wherein the processing unit is in communication with the data communication bus, and wherein the instructions carried out by the processing unit are received via the data communication bus from an external programming device connected to the data communication bus.

32. The electronics module of Claim 30, further comprising a memory in communication with the processing unit, wherein the instructions carried out by the processing unit are received from the memory.

33. The electronics module of Claim 30, further comprising a user input in communication with the processing unit, wherein the instructions carried out by the processing unit are received from the user input.

34. The electronics module of Claim 29, wherein the processing unit is configured to monitor data communicated on the data communication bus and selectively set one or more of the switching units in an open or closed state based on the data communicated on the data communication bus.

35. The electronics module of Claim 34, wherein the processing unit is configured to selectively set one or more of the switching units in an open state to electrically disconnect one or more of the electronic devices from the data communication bus if the processing unit detects an abnormality in the data communicated on the data communication bus.

36. The electronics module of Claim 35, wherein the processing unit is configured to electrically disconnect electronic devices in a sequence until the processing unit no longer detects the abnormality on the data communication bus.

37. The electronics module of Claim 35, wherein the processing unit is configured to electrically disconnect electronic devices in a determined order of criticality to the operation of the vehicle, from an electronic device designated least critical to an electronic device designated most critical.

38. The electronics module of Claim 34, further comprising a memory in communication with the processing unit for recording information related to the detected abnormality.

39. The electronics module of Claim 34, further comprising an output device in communication with the processing unit, wherein the processing unit is configured to report information to the output device relating to the detected abnormality.

40. The electronics module of Claim 29, further comprising a module connector having a plurality of electrical connection sites configured to connect to the electronic devices in the vehicle, wherein the plurality of switching units in the electronics module is connected to the plurality of electrical connection sites in the module connector.

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